

DETAILED ACTION

1. This Office action is in response to the amendment filed on July 15, 2009.
2. **Claims 1-4, 6-18, and 20-33** are pending.
3. **Claims 1-4, 6-18, and 20-33** have been amended.
4. **Claims 5 and 19** have been canceled.
5. **Claims 1-4, 6-18, and 20-33** are allowed, renumbered as 1-31.
6. The objections to Claims 1, 2, 14-18, and 20-25 are withdrawn in view of Applicant's amendments to the claims or Examiner's amendments to the claims.

Drawings

7. The drawings are objected to because Figure 4, Element 404 contains a typographical error: "[T]he performance of operating in the database system" should presumably read -- the performance of operations in the database system --. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either

“Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the Examiner, the Applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Examiner's Amendment

8. An Examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to Applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this Examiner's amendment was given in a telephone interview with Sean F. Parmenter (Reg. No. 53,437) on October 28, 2009.

The application has been amended as follows:

AMENDMENTS TO THE CLAIMS

Please amend Claims 1-3, 6, 8, 11, 14-17, 20, 23, 26, 28-31, and 33 as follows:

1. (Currently Amended) A method performed by a set of one or more computers associated with a database system for diagnosing performance in a database of the database system, the method comprising:

receiving, at at least one computer associated with the database system, information providing a specification of performance problems in a database, the specification of performance problems defining:

one or more performance problems that may occur while processing operations in the database, and

information that classifies each of the one or more performance problems as symptoms that may lead to a root performance problem being either a problem having the greatest impact on performance in the database or a problem that does not lead to other problems;

receiving, at at least one computer associated with the database system, information providing a set of one or more rules for the one or more performance problems that may occur while processing operations in the database, each rule in the set of one or more rules defining one or more conditions for a corresponding performance problem that when met indicate that at least one symptom that may lead to a root performance problem exists;

receiving, at at least one computer associated with the database system, information providing a set of one or more recommendation rules for the one or more performance problems that may occur while processing operations in the database, each recommendation rule in the set of one or more recommendation rules defining:

one or more recommendation conditions, and

recommendation information indicative of a solution when the one or more recommendation conditions are satisfied to a performance problem in the one or more performance problems that may occur while processing operations in the database;

generating, at at least one computer associated with the database system, a set of one or more rules trees based on the specification of performance problems, the set of one or more rules, and the set of one or more recommendation rules, the set of one or more rules trees configured to be traversed to determine a root problem in a hierarchy of the one or more performance problems that may occur while processing operations in the database, each rules tree having a set of nodes indicative of the symptoms that may lead to a root performance problem wherein each node in the set of nodes is associated with one or more rules in the set of one or more rules and one or more recommendation rules in the set of one or more recommendation rules;

receiving, from an internal process of the database system configured to capture information internally from one or more sessions at a computer associated with the database system, one or more values that quantify an impact for the one or more performance problems based on performance of operations in the database;

traversing, within the computer associated with the database system, one or more rules trees in the set of one or more rules trees to determine a first performance problem in the one or more performance problems that may occur while processing operations in the database based on whether the one or more values satisfy the one or more conditions defined for at least one rule of a node in the set of one or more rules trees;

determining, within the computer associated with the database system, recommendation information indicative of a solution to the first performance problem in the one or more performance problems based on satisfaction of one or more recommendation rules associated

with the node in the set of one or more rules trees whose at least one rule is satisfied by the one or more values; and

generating, within the computer system associated with the database system, information indicative of a recommendation for a solution for the first performance problem based on the recommendation information.

2. (Currently Amended) The method of claim 1, wherein traversing, within the computer associated with the database system, the one or more rules trees in the set of one or more rules trees to determine the first performance problem further comprises identifying the first performance problem as a root performance problem.

3. (Currently Amended) The method of claim 1, wherein receiving the specification of performance problems defining information that classifies each of the one or more performance problems as symptoms that may lead to a root performance problem comprises receiving information that classifies symptoms of a first set of performance problems and a second set of performance problems.

6. (Currently Amended) The method of claim 1, wherein receiving, from the internal process of the database system configured to capture information internally from one or more sessions at the computer associated with the database system, the one or more values comprise[[s]] receiving time values from the internal process of the database system that quantify the impact of the one or more performance problems.

8. (Currently Amended) The method of claim 1, wherein traversing, within the computer associated with the database system, the one or more rules trees in the set of one or more rules trees to determine the first performance problem comprises:

determining, within the computer associated with the database system, one or more operations in the database that caused the first performance problem; and

analyzing, within the computer ~~system~~ associated with the database system, information stored in the database of the database system for the one or more operations to determine the first performance problem.

11. (Currently Amended) The method of claim 1, further comprising:

determining, within the computer associated with the database system, the one or more recommendation rules from a set of one or more recommendation rules associated with the node in the set of one or more rules trees whose at least one rule is satisfied by the one or more values, each recommendation rule in the set of one or more recommendation rules indicative of at least one recommendation for a solution for the first performance problem ~~represented by~~ associated with the node;

determining, within the computer associated with the database system, one or more operations that caused the first performance problem; and

wherein determining, within the computer associated with the database system, recommendation information indicative of a solution to the first performance problem in the one or more performance problems comprises:

applying the set of one or more recommendation rules to information associated with the one or more operations; and

determining a recommendation for a solution for the first performance problem in response to a determination that the information associated with the one or more operations satisfies the set of one or more recommendation rules.

14. (Currently Amended) A computer-implemented method for automatically diagnosing one or more performance problems in a database of a database system, the computer-implemented method comprising:

receiving, at a computer system associated with the database system, information providing a specification of performance problems in the database, the specification of performance problems defining:

one or more performance problems that may occur while processing operations in the database, and

information that classifies each of the one or more performance problems as symptoms that may lead to a root performance problem being either a problem having the greatest impact on performance in the database or a problem that does not lead to other problems;

receiving, at the computer system associated with the database system, information providing a set of one or more rules for the one or more performance problems that may occur while processing operations in the database, each rule in the set of one or more rules defining a

set of one or more conditions for a corresponding performance problem that when met indicate that one or more symptoms that may lead to at least one root performance problem exist;

receiving, at the computer system associated with the database system, information providing a set of one or more recommendation rules for the one or more performance problems that may occur while processing operations in the database, each recommendation rule in the set of one or more recommendation rules defining:

one or more recommendation conditions, and

recommendation information indicative of a solution when the one or more recommendation conditions are satisfied to a performance problem in the one or more performance problems that may occur while processing operations in the database;

generating, at the computer system associated with the database system, a set of one or more rules trees based on the specification of performance problems, the set of one or more rules, and the set of one or more recommendation rules, the set of one or more rules trees configured to be traversed to determine a root performance problem in a hierarchy of the one or more performance problems that may occur while processing operations in the database, each rules tree having a set of nodes indicative of the symptoms that may lead to a root performance problem wherein each node in the set of nodes is associated with one or more rules in the set of one or more rules and one or more recommendation rules in the set of one or more recommendation rules;

collecting ~~information~~ one or more values using an internal process of the database system from one or more sessions that ~~quantifies~~ quantify an impact for one or more operations performed in the database;

associating, within the computer system associated with the database system, the information one or more values that ~~quantifies~~ quantify an impact for one or more operations with the one or more performance problems;

analyzing, within the computer system associated with the database system, the associated ~~information~~ one or more values for the one or more performance problems based on one or more rules trees in the set of one or more rules trees to determine a first performance problem in the one or more performance problems that may occur while processing operations in the database in response to whether the associated ~~information~~ one or more values ~~satisfies~~ satisfy the set of one or more conditions defined for at least one rule of a node in the set of one or more rules trees;

determining, within the computer system associated with the database system, recommendation information indicative of a solution to the first performance problem in the one or more performance problems based on satisfaction of one or more recommendation rules associated with the node in the set of one or more rules trees whose at least one rule is satisfied by the associated one or more values; and

generating, within the computer system associated with the database system, information indicative of a recommendation for a solution for the first performance problem based on the recommendation information.

15. (Currently Amended) The computer-implemented method of claim 14, wherein collecting the information one or more values using the internal process of the database system

from one or more sessions that quantifies quantify an impact for one or more operations performed in the database comprises:

determining, within the internal process of the database system, when one or more operations are being performed; and

timing the one or more operations using the internal process of the database system to generate one or more time values for the one or more operations that quantify the impact of the one or more operations.

16. (Currently Amended) The computer-implemented method of claim 15, wherein timing the one or more operations using the internal process of the database system comprises timing the one or more operations based on at least one of:

a time model that classifies a first set of operations in the database as wasteful operations, and

a wait model that classifies a second set of operations in the database waiting for completion of one or more external events.

17. (Currently Amended) The computer-implemented method of claim 14, wherein analyzing, within the computer system associated with the database system, the associated information one or more values for the one or more performance problems based on the one or more rules trees in the set of one or more rules trees comprises identifying the first performance problem as a root performance problem.

20. (Currently Amended) The computer-implemented method of claim 14, wherein analyzing, within the computer system associated with the database system, the associated ~~information~~ one or more values for the one or more performance problems comprises:

determining, within the computer system associated with the database system, one or more operations in the database that caused the first performance problem; and

reviewing, within the computer system associated with the database system, stored information for the one or more operations to determine the first performance problem.

23. (Currently Amended) The computer-implemented method of claim 14, further comprising:

determining, within the computer system associated with the database system, the one or more recommendation rules from a set of one or more recommendation rules associated with the node in the set of one or more rules trees whose at least one rule is satisfied, each recommendation rule in the set of one or more recommendation rules indicative of at least one recommendation for a solution to the first performance problem ~~represented by~~ associated with the node;

determining, within the computer system associated with the database system, one or more operations that caused the first performance problem; and

wherein analyzing, within the computer system associated with the database system, the associated information for the one or more performance problems based on the one or more rules trees in the set of one or more rules trees to determine the first performance problem comprises:

applying the set of one or more recommendation rules to information associated with the one or more operations; and

determining a recommendation for a solution to the first performance problem in response to a determination that the information associated with the one or more operations satisfies the set of one or more recommendation rules.

26. (Currently Amended) A computer-readable storage medium configured to store a set of code modules which when executed by a processor of a computer system become operational with the processor for diagnosing performance in a database associated with a database system, the computer-readable storage medium comprising:

code for receiving information providing a specification of performance problems in a database, the specification of performance problems defining:

one or more performance problems that may occur while processing operations in the database, and

information that classifies each of the one or more performance problems as symptoms that may lead to a root performance problem being either a problem having the greatest impact on performance in the database or a problem that does not lead to other problems;

code for receiving information providing a set of one or more rules for the one or more performance problems that may occur while processing operations in the database, each rule in the set of one or more rules defining one or more conditions for a corresponding performance

problem that when met indicating that at least one symptom that may lead to a root performance problem exists;

code for receiving information providing a set of one or more recommendation rules for the one or more performance problems that may occur while processing operations in the database, each recommendation rule in the set of one or more recommendation rules defining:

one or more recommendation conditions, and

recommendation information indicative of a solution when the one or more recommendation conditions are satisfied to a performance problem in the one or more performance problems that may occur while processing operations in the database;

code for generating a set of one or more rules trees based on the specification of performance problems, the set of one or more rules, and the set of one or more recommendation rules, the set of one or more rules trees configured to be traversed to determine a root problem in a hierarchy of the one or more performance problems that may occur while processing operations in the database, each rules tree having a set of nodes indicative of the symptoms that may lead to a root performance problem wherein each node in the set of nodes is associated with one or more rules in the set of one or more rules and one or more recommendation rules in the set of one or more recommendation rules;

code for receiving, from an internal process of the database system configure to capture information internally from one or more sessions, one or more values that quantify an impact for the one or more performance problems based on performance of operations in the database;

code for traversing one or more rules trees in the set of one or more rules trees to determine a first performance problem in the one or more performance problems that may occur

while processing operations in the database based on whether the one or more values satisfy the one or more conditions defined ~~[[fro]]~~ for at least one rule of a node in the set of one or more rules trees;

code for determining recommendation information indicative of a solution for the first performance problem in the one or more performance problems based on satisfaction of one or more recommendation rules associated with the node in the set of one or more rules trees whose at least one rule is satisfied by the one or more values; and

code for generating information indicative of a recommendation for a solution for the first performance problem based on the recommendation information.

28. (Currently Amended) The computer-readable storage medium of claim 26, further comprising:

code for determining the one or more recommendation rules from a set of one or more recommendation rules associated with the node in the set of one or more rules trees whose at least one rule is satisfied by the one or more values, each recommendation rule in the set of one or more recommendation rules indicative of at least one recommendation for a solution for the first performance problem ~~represented by~~ associated with the node;

code for determining one or more operations that caused the first performance problem;

code for applying the set of one or more recommendation rules to information associated with the one or more operations; and

code for determining a recommendation for a solution for the first performance problem in response to a determination that the information associated with the one or more operations satisfies the set of one or more recommendation rules.

29. (Currently Amended) A computer-readable storage medium configured to store a set of code modules which when executed by a processor of a computer system become operational with the processor for automatically diagnosing one or more performance problems in a database of a database system, the computer-readable storage medium comprising:

code for receiving information providing a specification of performance problems in the database, the specification of performance problems defining:

one or more performance problems that may occur while processing operations in the database, and

information that classifies each of the one or more performance problems as symptoms that may lead to a root performance problem being either a problem having the greatest impact on performance in the database or a problem that does not lead to other problems;

code for receiving information providing a set of one or more rules for the one or more performance problems that may occur while processing operations in the database, each rule in the set of one or more rules defining a set of one or more conditions for a corresponding performance problem that when met indicated that one or more symptoms that may lead to at least one root performance problem exist;

code for receiving information providing a set of one or more recommendation rules for the one or more performance problems that may occur while processing operations in the database, each recommendation rule in the set of one or more recommendation rules defining:

one or more recommendation conditions, and

recommendation information indicative of a solution when the one or more recommendation conditions are satisfied to a performance problem in the one or more performance problems that may occur while processing operations in the database;

code for generating a set of one or more rules trees based on the specification of performance problems, the set of one or more rules, and the set of one or more recommendation rules, the set of one or more rules trees configured to be traversed to determine a root problem in a hierarchy of the one or more performance problems that may occur while processing operations in the database, each rules tree having a set of nodes indicative of the symptoms that may lead to a root performance problem wherein each node in the set of nodes is associated with one or more rules in the set of one or more rules and one or more recommendation rules in the set of one or more recommendation rules;

code for collecting ~~information~~ one or more values using an internal process of the database system ~~from one or more sessions~~ that ~~quantifies~~ quantify an impact for one or more operations performed in the database;

code for associating the ~~information~~ one or more values that ~~quantifies~~ quantify an impact for one or more operations with the one or more performance problems;

code for analyzing the associated ~~information~~ one or more values for the one or more performance problems based on one or more rules trees in the set of one or more rules trees to

determine a first performance problem in the one or more performance problems that may occur while processing operations in the database in response to whether the associated ~~information~~ one or more values ~~satisfies~~ satisfy the set of one or more conditions defined for at least one rule of a node in the set of one or more rules trees;

code for determining recommendation information indicative of a solution for the first performance problem in the one or more performance problems based on satisfaction of one or more recommendation rules associated with the node in the set of one or more rules trees whose at least one rule is satisfied by the associated one or more values; and

code for generating information indicative of a recommendation for a solution for the first performance problem based on the recommendation information.

30. (Currently Amended) The computer-readable storage medium of claim 29, wherein the code for collecting the ~~information~~ one or more values using the internal process of the database system from one or more sessions that ~~quantifies~~ quantify an impact for one or more operations performed in the database comprises:

code for determining when one or more operations that are associated with the one or more performance problems are being performed; and

code for timing the one or more operations that are associated with the one or more performance problems to generate one or more time values for the one or more operations that quantify the impact of the one or more operations.

31. (Currently Amended) The computer-readable storage medium of claim 29, wherein the code for analyzing the associated ~~information~~ one or more values for the one or more performance problems based on the one or more rules trees in the set of one or more rules trees to determine the first performance problem comprises:

code for determining one or more operations in the database that caused the first performance problem; and

code for reviewing stored information for the one or more operations to determine the first performance problem.

33. (Currently Amended) The computer-readable storage medium of claim 29, further comprising:

code for determining the one or more recommendation rules from a set of one or more recommendation rules associated with the node in the set of one or more rules trees whose at least one rule is satisfied by the associated one or more values, each recommendation rule in the set of one or more recommendation rules indicative of at least one recommendation for a solution to the first performance problem ~~represented by~~ associated with the node;

code for determining one or more operations that caused the first performance problem;

code for applying the set of one or more recommendation rules to information associated with the one or more operations; and

code for determining a recommendation for a solution for the first performance problem in response to a determination that the information associated with the one or more operations satisfies the set of one or more recommendation rules.

-- END OF AMENDMENT --

Reasons for Allowance

9. The following is an Examiner's statement of reasons for allowance:

The cited prior art taken alone or in combination fail to teach, in combination with the other claimed limitations, "traversing, within the computer associated with the database system, one or more rules trees in the set of one or more rules trees to determine a first performance problem in the one or more performance problems that may occur while processing operations in the database based on whether the one or more values satisfy the one or more conditions defined for at least one rule of a node in the set of one or more rules trees" and "determining, within the computer associated with the database system, recommendation information indicative of a solution to the first performance problem in the one or more performance problems based on satisfaction of one or more recommendation rules associated with the node in the set of one or more rules trees whose at least one rule is satisfied by the one or more values" as recited in independent Claim 1; and further fail to teach, in combination with the other claimed limitations, similarly-worded limitations recited in independent Claims 14, 26, and 29.

The closest cited prior art, the combination of US 6,035,306 (hereinafter "Lowenthal") and US 4,849,879 (hereinafter "Chinnaswamy"), teaches systems for optimizing placement of database objects in large database systems having database files stored over multiple disk drives. However, the combination of Lowenthal and Chinnaswamy fails to teach "traversing, within the computer associated with the database system, one or more rules trees in the set of one or more

rules trees to determine a first performance problem in the one or more performance problems that may occur while processing operations in the database based on whether the one or more values satisfy the one or more conditions defined for at least one rule of a node in the set of one or more rules trees” and “determining, within the computer associated with the database system, recommendation information indicative of a solution to the first performance problem in the one or more performance problems based on satisfaction of one or more recommendation rules associated with the node in the set of one or more rules trees whose at least one rule is satisfied by the one or more values” as recited in independent Claim 1; and further fails to teach similarly-worded limitations recited in independent Claims 14, 26, and 29.

Any comments considered necessary by Applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to Applicant’s disclosure.

11. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Qing Chen whose telephone number is 571-270-1071. The Examiner can normally be reached on Monday through Thursday from 7:30 AM to 4:00 PM. The Examiner can also be reached on alternate Fridays.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Wei Zhen, can be reached on 571-272-3708. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the TC 2100 Group receptionist whose telephone number is 571-272-2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Q. C./

Examiner, Art Unit 2191

/Wei Y Zhen/

Supervisory Patent Examiner, Art Unit 2191